Apprenticeship and Industry Training

Concrete Finisher

Apprenticeship Course Outline

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Government of Alberta

Apprenticeship and Industry Training

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Concrete Finisher
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Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyperson or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeypersons, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Concrete Finisher Provincial Apprenticeship Committee.

The graduate of the Concrete Finisher apprenticeship program is a certified journeyperson who will be able to:

- perform tests to confirm concrete quality
- interpret building codes, plans and specifications as they apply to the trade
- place and finish concrete in a professional manner
- cut, patch, maintain and repair concrete structures
- perform assigned tasks in accordance with quality and production standards required by industry

Apprenticeship and Industry Training System

Industry-Driven

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta Apprenticeship and Industry Training Board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

Alberta Apprenticeship and Industry Training Board

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the Apprenticeship and Industry Training Act. The board also provides advice to the Minister of Advanced Education and Technology on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

Industry Committee Network

Alberta's apprenticeship and industry training system relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's provincial apprenticeship committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

Provincial Apprenticeship Committees (PAC)

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
    - standards and requirements for training and certification in their trade
    - courses and examinations in their trade
    - apprenticeship and certification
    - designation of trades and occupations
    - regulations and orders under the Apprenticeship and Industry Training Act
- monitor the activities of local apprenticeship committees in their trade
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- consult with other committees under the Apprenticeship and Industry Training Act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- may participate in resolving certain disagreements between employers and employees
- carry out functions assigned by the board

Concrete Finisher PAC Members at the Time of Publication

Mr. E. Kalis	Edmonton	Presiding Officer
Mr. W. Martin	Calgary	Employer
Mr. D. Sweeney	Calgary	Employer
Mr. T. Krawec	Edmonton	Employer
Mr. B. Shandro	Edmonton	Employer
Mr. D. Bogue	Calgary	Employee
Mr. S. Fraser	Calgary	Employee
Mr. R. Allen	Edmonton	Employee
Mr. J. Androschuk	Edmonton	Employee

Alberta Government

Alberta Advanced Education and Technology works with industry, employer and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and employers
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

Technical Institutes and Colleges

The technical institutes and colleges are key participants in Alberta's apprenticeship and industry training system. They work with the board, industry committees and Alberta Advanced Education and Technology to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs. They develop lesson plans from the course outlines established by industry and provide technical training to apprentices.

Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board fully supports safe learning and working environments and encourages the teaching of proper safety procedures both within trade specific training and in the workplace.

Trade specific safety training is an integral component of technical training, while ongoing or general non-trade specific safety training remains the responsibility of the employer and the employee as required under workplace health and safety legislation.

Workplace Responsibilities

The employer is responsible for:

- training employees and apprentices in the safe use and operation of equipment
- providing and maintaining safety equipment, protective devices and clothing
- enforcing safe working procedures
- providing safeguards for machinery, equipment and tools
- observing all accident prevention regulations

The employee and apprentice are responsible for:

- working in accordance with the safety regulations pertaining to the job environment
- working in such a way as not to endanger themselves, fellow employees or apprentices

Workplace Health and Safety

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Workplace Health and Safety (Alberta Employment, Immigration and Industry) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at www.worksafely.org

Technical Training

Apprenticeship technical training is delivered by the technical institutes and many colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place great emphasis on safe technical practices that complement safe workplace practices and help to develop a skilled, safe workforce.

The following institutions deliver Concrete Finisher apprenticeship technical training:

Southern Alberta Institute of Technology (Mayland Heights Campus)

Procedures for Recommending Revisions to the Course Outline

Advanced Education and Technology has prepared this course outline in partnership with the Concrete Finisher Provincial Apprenticeship Committee.

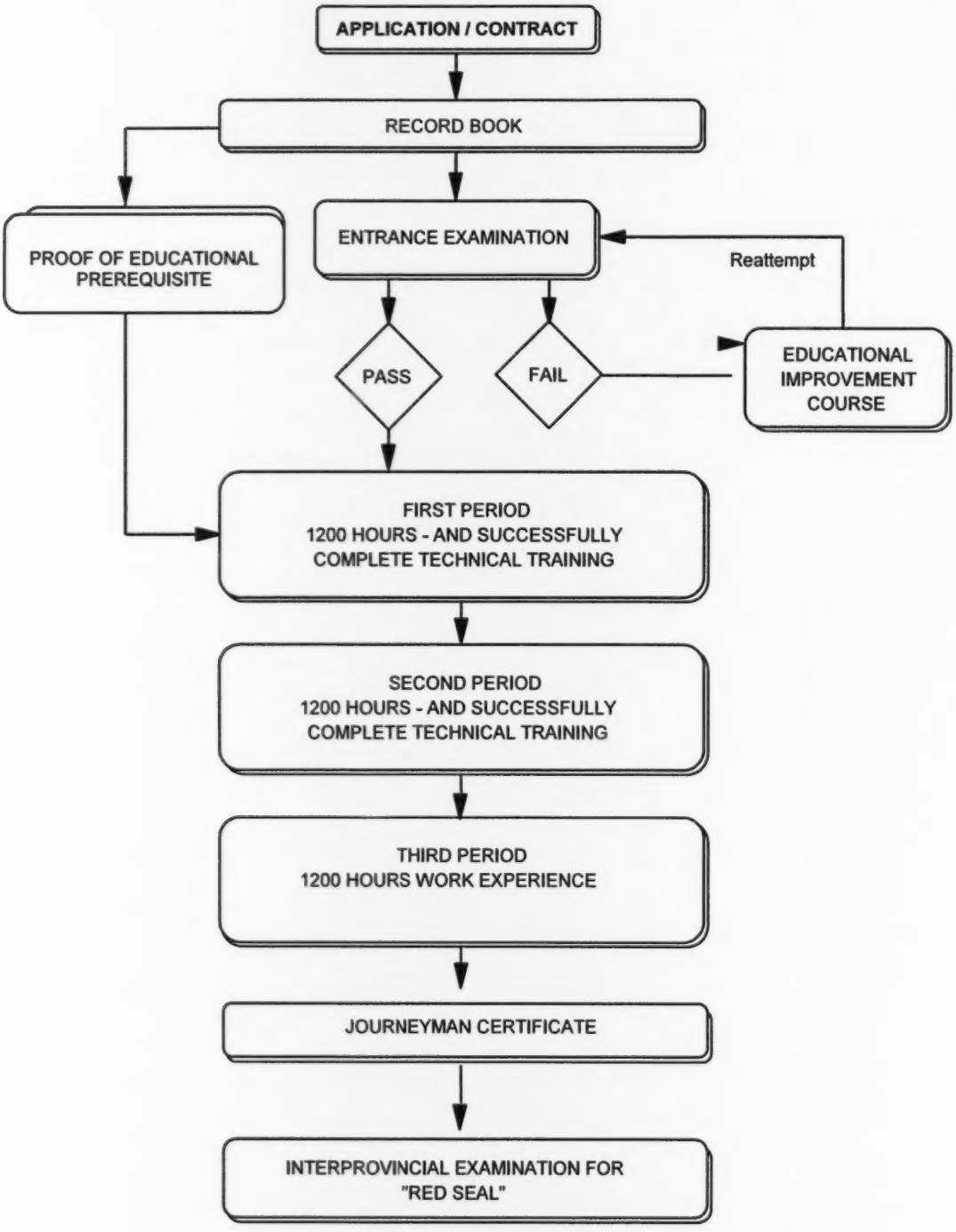
This course outline was approved on March 18, 2005 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Concrete Finisher Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
Advanced Education and Technology
10th floor, Commerce Place
10155 102 Street NW
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Concrete Finisher Provincial Apprenticeship Committee.

Apprenticeship Route toward Certification



Concrete Finisher Training Profile
FIRST PERIOD
(4 Weeks 30 Hours per Week – Total of 120 Hours)

SECTION ONE

HAND AND POWER TOOLS — **18 HOURS**

A	B	C
Measuring and Layout Tools — 3 Hours	Cutting and Demolition Tools — 1 Hour	Concrete Placing Tools — 1 Hour
D	**E**	**F**
Tools for the Surface Treatment of Concrete — 2 Hours	Mixing and Conveying Equipment — 2 Hours	Power Floats and Trowels — 3 Hours
G		
Sidewalk Project — 6 Hours		

SECTION TWO

SAFETY — **9 HOURS**

A	B	C
Safety Regulations and Procedures — 2 Hours	Personal Protective Equipment — 1 Hour	Fires and Controls — 2 Hours
D	**E**	
WHMIS — 1 Hour	Safety and Maintenance for Power Tools and Equipment — 3 Hours	

SECTION THREE

CONCRETE — **15 HOURS**

A	B	C
Portland Cements — 6 Hours	Air Entrainment — 3 Hours	Concrete Aggregates — 4 Hours
D		
Transporting Concrete — 2 Hours		

SECTION FOUR

CONCRETE PLACEMENT — **9 HOURS**

A
Placement of Concrete — 9 Hours

SECTION FIVE

CONCRETE FINISHING — **26 HOURS**

A	B	C
Concrete Finishing — 9 Hours	Concrete Joints — 5 Hours	Place and Finish Concrete — 12 Hours

SECTION SIX

CONCRETE CURING — **7 HOURS**

A
Concrete Curing Methods — 7 Hours

SECTION SEVEN

ESTIMATING AND PLANS — **36 HOURS**

A	B	C
Introduction to Applies Mathematics — 2 Hours	S.I. Metric System — 2 Hours	Imperial System — 2 Hours
D	**E**	**F**
Lineal Measure — 2 Hours	Square Measure — 2 Hours	Cubic Measure — 2 Hours

	G	H	I
	Percentage 2 Hours	Concrete Volume Quantities 7 Hours	Residential Blueprints 15 Hours

Concrete Finisher Training Profile
Second Period
(4 weeks-30 per week-total of 120 Hours)

		A	B	C
SECTION ONE	HAND AND POWER TOOLS 9 HOURS ⇨	Concrete Pavers, Power Screeds, Vibrators, and Sprayers 3 Hours	Grinders, Scabblers and Scarifiers 2 Hours	Cutting and Coring Tools 4 Hours
SECTION TWO	SAFETY 10 HOURS ⇨	Construction Safety Procedures 10 Hours		
SECTION THREE	SITE LAYOUT AND FORMS 18 HOURS ⇨	Levelling and Grading Procedures 3 Hours	Site Preparation 3 Hours	Methods of Forming 3 Hours
		D	E	
		Concrete Reinforcing and Accessories 3 Hours	Construction of Flat Slab Formwork 6 Hours	
SECTION FOUR	CONCRETE MATERIALS 15 HOURS ⇨	Concrete Design and Dry State Characteristics 4 Hours	Concrete Testing in Plastic State 3 Hours	Concrete Admixtures 4 Hours
		D	E	
		Concrete Toppings and Grouts 2 Hours	Precast Concrete 2 Hours	
SECTION FIVE	CONCRETE PLACEMENT 14 HOURS ⇨	Architectural Concrete Finishes 6 Hours	Special Concrete Finishes 8 Hours	
SECTION SIX	CONCRETE FINISHING AND CURING 18 HOURS ⇨	Advanced Concrete Placing and Finishing 15 Hours	Hot and Cold Weather Curing 3 Hours	
SECTION FIVE	ESTIMATING AND PLANS 36 HOURS ⇨	Related Calculations 12 Hours	Commercial Blueprints 20 Hours	Workplace Coaching Skills and Advisory Network 4 Hours

NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

FIRST PERIOD TECHNICAL TRAINING
CONCRETE FINISHER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: ..... HAND AND POWER TOOLS ..... 18 HOURS

A. Measuring and Layout Tools ..... 3 Hours

Outcome: ***Identify and describe measuring and layout tools.***

1. Identify measuring tools.
2. Identify hand levels.
3. Describe lines and accessories.
4. Describe miscellaneous layout and alignment tools.

B. Cutting and Demolition Tools ..... 1 Hour

Outcome: ***Identify and describe cutting and demolition tools.***

1. Describe the use of cutting and fastening tools.
2. Describe the use of dismantling and demolition tools.
3. Describe the use of chipping and abrading tools.

C. Concrete Placing Tools ..... 1 Hour

Outcome: ***Identify and describe concrete placing tools.***

1. Describe conveying and distributing tools.
2. Describe vibrators and consolidating tools.

D. Tools for the Surface Treatment of Concrete ..... 2 Hours

Outcome: ***Identify and describe tools for the surface treatment of concrete.***

1. Describe the use of floats and darbies.
2. Describe the use of trowels, edgers and jointers.
3. Describe the use of brushes and finishing brooms.
4. Describe clean up and maintenance procedures for hand tools.

E. Mixing and Conveying Equipment ..... 2 Hours

Outcome: ***Describe mixing and conveying equipment.***

1. Describe types of mixers.
2. Relate the principles of mixing concrete.
3. Relate the principles of concrete transport.
4. Describe concrete conveying equipment.

F. Power Floats and Trowels.....3 Hours

Outcome: ***Identify and describe power floats and trowels.***

1. Describe the process of power floating.
2. Describe the process of power trowelling.
3. Identify and describe safe use of power trowels.

G. Sidewalk Project .....6 Hours

Outcome: ***Construct a sidewalk project using a given specification.***

1. Layout a sidewalk using appropriate measuring and layout tools.
2. Prepare forms for a sidewalk using appropriate cutting and fastening tools.
3. Place concrete in sidewalk forms using appropriate placing tools.
4. Finish concrete sidewalk using appropriate finishing tools.

SECTION TWO: .....SAFETY.....9 HOURS

A. Safety Regulations and Procedures .....2 Hours

Outcome: ***Identify safety regulations as they apply to safe work practices.***

1. Define selected terms in the Occupational Health and Safety Act.
2. Describe selected general provisions.
3. Describe selected safety provisions for machinery.
4. Describe scaffolding requirements.
5. Describe minimum requirements of ladders.

B. Personal Protective Equipment.....1 Hour

Outcome: ***Identify and describe potential industrial health hazards and the use of personal protective equipment.***

1. Describe minimum requirements of personal protective equipment.
2. Select safety clothing and protective equipment.
3. Describe protection in dusty environments.
4. Describe procedures for working with toxic materials.

C. Fires and Controls .....2 Hours

Outcome: ***Recognize and Identify fires and controls.***

1. Recognize potentially dangerous fire hazards and assess preventative measures.
2. Identify fires by class to ensure the correct equipment is used for fire control.
3. Locate and identify the fire extinguishers and alarm controls in the shop and learning resources area.

D. W.H.M.I.S.....1 Hour

Outcome: ***Follow W.H.M.I.S. guidelines.***

1. Explain what the letters W.H.M.I.S. mean.

2. List the W.H.M.I.S. classes.
3. Describe the hazard symbols; the general hazards and precautions needed when handling substances of each of the W.H.M.I.S. symbols.
4. Describe the contents required on W.H.M.I.S. labels and data sheets and where they are to be kept and accessed.

E. Safety and Maintenance for Power Tools and Equipment .....3 Hours

Outcome: ***Describe safety and maintenance practices for power tools and equipment.***

1. Describe the safety and maintenance requirements of electrically operated tools.
2. Describe the safety and maintenance requirements of gasoline powered tools.
3. Describe the ventilation requirements for gasoline-powered engines.
4. Describe the safety and maintenance requirements of compressors.

SECTION THREE: .....CONCRETE.....15 HOURS

A. Portland Cements .....6 Hours

Outcome: ***Identify Portland cement.***

1. Identify the different types and make up of Portland cements, and their applications.
2. Describe the applications for the different types of Portland cements.
3. Describe fly ash.
4. Describe silica fume.

B. Air Entrainment .....3 Hours

Outcome: ***Identify and describe air entrainment.***

1. Identify and describe air entrainment admixtures.

C. Concrete Aggregates.....4 Hours

Outcome: ***Identify and describe concrete aggregates.***

1. Describe coarse aggregates.
2. Describe fine aggregates.
3. Describe the effect of aggregates on concrete quality.

D. Transporting Concrete .....2 Hours

Outcome: ***Describe the transporting of concrete.***

1. Describe concrete transportation and placement for forms and decks with reference to consolidation and integration of deposits (lifts).
2. Identify and describe the cause of segregation and the use of chutes, tremies and pumps.

SECTION FOUR: ..... CONCRETE PLACEMENT ..... 9 HOURS

A. Placement of Concrete ..... 9 Hours

Outcome: ***Identify and describe the placement of concrete.***

1. Identify site preparation.
2. Describe depositing concrete.
3. Describe consolidating concrete.

SECTION FIVE: ..... CONCRETE FINISHING ..... 26 HOURS

A. Concrete Finishing ..... 9 Hours

Outcome: ***Identify and describe concrete finishing.***

1. Identify surface treatments.
2. Describe how to create various surface treatments.

B. Concrete Joints ..... 5 Hours

Outcome: ***Identify and describe concrete joints.***

1. Compare the three basic types of functional joints:
   a) control (contraction) joints
   b) isolation (expansion) joints
   c) construction joints

C. Place and Finish Concrete ..... 12 Hours

Outcome: ***Perform concrete placement.***

1. Layout a flat slab.
2. Prepare forms for a slab.
3. Place concrete in slab forms.
4. Finish slab.
5. Place and finish concrete stairs.

SECTION SIX: ..... CONCRETE CURING ..... 7 HOURS

A. Concrete Curing Methods ..... 7 Hours

Outcome: ***Describe curing methods.***

1. Describe curing without water.
2. Describe curing with water.
3. Explain the importance of hydration to the curing of concrete.
4. Cure concrete.

SECTION SEVEN: .....ESTIMATING AND PLANS.....36 HOURS

A. Introduction to Applied Mathematics .....2 Hours

Outcome: ***Demonstrate ability to complete basic math operations.***

1. Complete problems in rounding off numbers.
2. Complete problems in addition, subtraction, multiplication and division using whole numbers.
3. Complete problems that combine addition, subtraction, multiplication and division.

B. S.I. Metric System .....2 Hours

Outcome: ***Calculate metric lengths, capacity and mass.***

1. Apply the metric system to measuring lengths.
2. Apply the metric system to measuring capacity and mass.

C. Imperial System .....2 Hours

Outcome: ***Calculate Imperial (pound) math operations.***

1. Apply the inch-pound system to measuring lengths.
2. Apply the inch-pound system to measuring capacity and weight.
3. Use fractions in addition, subtraction, multiplication and division.
4. Convert between fractions and decimals.

D. Lineal Measure .....2 Hours

Outcome: ***Calculate lineal measure.***

1. Use formulas to calculate perimeters and circumferences.
2. Use the Pythagorean Theorem to calculate problems involving right triangles.

E. Square Measure .....2 Hours

Outcome: ***Calculate square measure.***

1. Correctly identify and use formulas dealing with areas.

F. Cubic Measure .....2 Hours

Outcome: ***Calculate cubic measure.***

1. Correctly identify and use formulas dealing with volumes.

G. Percentage.....2 Hours

Outcome: ***Calculate percentages.***

1. Write percent numbers as decimal numbers.
2. Write decimal numbers as percent numbers.
3. Calculate a percent of a number.
4. Calculate the percentage one number is of another.
5. Calculate a number when a percentage of it is known.

H. Concrete Volume Quantities ..... 7 Hours

Outcome: ***Calculate concrete volumes.***

1. Study an example estimate of foundation concrete and related work.
2. Estimate a series of concrete and related work problems.

I. Residential Blueprints ..... 15 Hours

Outcome: ***Interpret residential blueprints.***

1. Read and interpret a set of residential blueprints showing:
   a) foundation plan
   b) floor plan
   c) elevations
   d) sections and details
   e) other trades
2. Identify and interpret scale rules and how to apply them.
3. Identify and draw detail symbols of materials used in sectional and other drawings.
4. Identify and describe alphabet of lines.

SECOND PERIOD TECHNICAL TRAINING
CONCRETE FINISHER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: HAND AND POWER TOOLS ..... 9 HOURS

A. Concrete Pavers, Power Screeds, Vibrators and Sprayers ..... 3 Hours

Outcome: ***Identify and describe concrete pavers, power screeds, vibrators and sprayers.***

1. Describe the use of concrete pavers.
2. Describe the use of power screeds.
3. Describe the use of vibrators.
4. Describe the use of sprayers.

B. Grinders, Scabblers and Scarifiers ..... 2 Hours

Outcome: ***Identify and describe grinders, scabbers and scarifiers.***

1. Describe the use of grinders.
2. Describe the use of scabblers.
3. Describe the use of scarifiers.

C. Cutting and Coring Tools ..... 4 Hours

Outcome: ***Identify and describe cutting and coring tools.***

1. Describe the tools used to cut concrete.
2. Describe saw blades used to cut concrete.
3. Describe the tools used to drill and core cured concrete.

SECTION TWO: SAFETY ..... 10 HOURS

A. Construction Safety Procedures ..... 10 Hours

Outcome: ***Review construction safety procedures.***

1. Review Occupational Health and Safety (OH & S) regulations.
2. Review the use of personal protective equipment.
3. Review the use of fire extinguishers and fire controls.
4. Review WHMIS regulations.
5. Review the safe use of power tools.

SECTION THREE: ..... SITE LAYOUT AND FORMS ..... 18 HOURS

A. Levelling and Grading Procedures ..... 3 Hours

Outcome: ***Identify and describe levelling and grading procedures.***

1. Describe zoning, bylaws and permits required before preparing site.
2. Identify the location of utilities on a property.
3. Interpret soil analysis reports for slabs on grade.
4. Describe the procedures for cut and fill and compaction.
5. Describe fillcrete.

B. Site Preparation ..... 3 Hours

Outcome: ***Identify and describe site preparation.***

1. Identify builders' levels: their parts, accessories and uses.
2. Identify and describe levelling rods.
3. Describe transfer of elevations.
4. Describe cut and fill and grades or slopes.
5. Identify and describe the use of laser levels.
6. Identify and describe the use of hand levels, line levels and string line to determine elevations.

C. Methods of Forming ..... 3 Hours

Outcome: ***Identify and describe methods of forming.***

1. Identify typical slab on grade forms.
2. Describe beam and girder form systems, including spandrel beams.
3. Identify slab decks and ribbed and waffle systems.
4. Describe the forces transmitted during placement of concrete.
5. Identify critical areas in forms that could cause a failure during concrete casting and describe how forms are designed to minimise this risk.
6. Describe form watching.
7. Identify concrete stairs and forming methods.

D. Concrete Reinforcing and Accessories ..... 3 Hours

Outcome: ***Identify and describe concrete reinforcing and accessories.***

1. Describe the gauges and types of welded wire fabric.
2. Identify type and sizes of deformed bars.
3. Identify reinforcing placement for concrete stairs.
4. Identify steel fibres and fibre reinforcement.

E. Construction of Flat Slab Formwork ..... 6 Hours

Outcome: ***Construct flat slab formwork.***

1. Establish the base line.
2. Establish corners.

3. Erect batter boards.
4. Set edge forms to grade.
5. Set grade stakes.
6. Set screeds.

SECTION FOUR: ..... CONCRETE MATERIALS ..... 15 HOURS

A. Concrete Design and Dry State Characteristics ..... 4 Hours

Outcome: ***Identify and describe concrete design and dry state characteristics.***

1. Define normal and special purpose aggregates and how normal density aggregate quality is controlled.
2. Identify the range of compressive strengths of concrete batches and the typical demands in industry.
3. Compare batching by weight and by volume.
4. Describe the hydration process and how to retain moisture.
5. Describe curing methods in hot and cold weather.

B. Concrete Testing in Plastic State ..... 3 Hours

Outcome: ***Identify and describe concrete testing in plastic state.***

1. Identify and describe tests conducted on plastic concrete.
2. Identify and describe various slumps of concrete.

C. Concrete Admixtures ..... 4 Hours

Outcome: ***Identify and describe concrete additives.***

1. Define admixtures for concrete.
2. Identify admixtures, their uses and limitations.
3. Describe the following three most commonly used admixtures:
   a) water reducing
   b) air entraining
   c) accelerating

D. Concrete Toppings and Grouts ..... 2 Hours

Outcome: ***Identify and describe concrete toppings and grouts.***

1. Describe where and how topping finishes are used and applied.
2. Identify the basic composition of grouts and mortars.
3. Describe the application of grouts and mortars.
4. Describe patching and bonding materials.

E. Precast Concrete ..... 2 Hours

Outcome: ***Identify and describe precast concrete.***

1. Compare post-tensioned and pre-tensioned precast members.
2. Describe tilt up units.

SECTION FIVE: ..... CONCRETE PLACEMENT ..... 14 HOURS

A. Architectural Concrete Finishes ..... 6 Hours

Outcome: ***Identify and describe architectural concrete finishes.***

1. Describe rubbed and floated finishes.
2. Describe parged and stuccoed finishes.
3. Describe spray-on coatings.
4. Describe the use of white and coloured concrete.
5. Describe exposed aggregate finishes.
6. Describe the use of:
   a) stamps
   b) mules
   c) templates
   d) special forms
   e) form liners

B. Special Concrete Finishes ..... 8 Hours

Outcome: ***Identify and describe identify special concrete finishes.***

1. Describe the dry shake method of finishing concrete.
2. Describe white and coloured concrete finishing methods.
3. Describe surface hardeners and slip resistance.
4. Describe non-slip finishes.
5. Describe seeded exposed aggregate finishes.
6. Identify commonly used special finishes.
7. Describe the use of epoxies.
8. Explain the application of polyurethane and polyester coatings.

SECTION SIX: .....CONCRETE FINISHING AND CURING ..... 18 HOURS

A. Advanced Concrete Placing and Finishing ..... 15 Hours

Outcome: ***Place and finish concrete.***

1. Finish a coloured slab with a stamped surface pattern.
2. Apply a coloured hardener using the dry shake method.
3. Use the water washing and brushing method to achieve an exposed aggregate finish.
4. Use the seeding method to achieve an exposed aggregate finish.
5. Patch and repair concrete curb.

B. Hot and Cold Weather Curing ..... 3 Hours

Outcome: ***Identify and describe hot and cold weather curing.***

1. Explain cold weather curing procedures.
2. Explain hot weather curing procedures.

SECTION SEVEN: ..... ESTIMATING AND PLANS ..... 36 HOURS

A. Related Calculations ..... 12 Hours

Outcome: ***Solve calculation problems.***

1. Review problems relating to addition, subtraction, multiplication and division.
2. Review problems relating to percentage.
3. Review problems relating to ratio and proportion.
4. Review problems relating to perimeters.
5. Review problems relating to the Pythagorean Theorem.
6. Review problems relating to areas.
7. Review problems relating to volumes.
8. Calculate foundation concrete volumes.

B. Commercial Blueprints ..... 20 Hours

Outcome: ***Interpret commercial blueprints.***

1. Read and interpret a set of blueprints of a commercial building showing:
   a) floor plans and elevations
   b) building sections and elevations
   c) room finish
   d) wall sections
   e) miscellaneous details
   f) structural details
   g) mechanical layout
   h) electrical layout
   i) site plan
   j) details drawings
2. Identify and describe alphabet of lines.

C. Workplace Coaching Skills and Advisory Network ..... 4 Hours

1. Describe the following coaching skills used for training apprentices:
   a) identify the point of the lesson
   b) link the lesson
   c) demonstrate a skill
   d) provide opportunity to practice a skill
   e) give feedback to the learner
   f) assess the learner's progress
2. Describe the roles and purposes of the advisory network and the Provincial Apprenticeship Committee for the Concrete Finisher Trade.

Excellence through training and experience

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